

## Mathemathics Learning Through The Problems Of Environmental

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### Abstract

*Mathematics has been known by humans since the first person lived in the world. He already knew Mathabout equality and inequality concepts. Mathematics science is discovered through problems of environmental. We have known Realistic Mathematics Education (RME) asa kind of Mathematics learning, Contextual Teaching Learning (CTL), etc. But actually we learn mathematics to study how God has taught Mathematics to humans through the natural phenomenon. Students or persons would be interested in something if they are told about something related to their experiences. Every teacher gives problems to students related to their knowledge, their environment, and their experiences. We can conclude that Mathematics learning can be learned easily based on their experience, knowledge and the environmental problems (EKEP) method or in Indonesia is called Pengalaman Pengetahuandan Persoalan Lingkungan (PPPL/P3L) on their lives.*

### 1. Introduction

Firstly, the universe was only black mist. God had changed it to become some spheres. Those were some stars, some planets, and some satellites. The stars shined. The sun is the brightest star that it is always bright, but it is felt bright at noon and dark at night in the earth. It was the first step God made the cosmos.



Figure1.1. Hanks of black mist and the cosmos

The second step, God has grown some vegetation like vegetables, forest, and other plants in the earth. It seems greener. The characteristics of vegetation are that they proliferate, breathe, need food and water, but they do not move from one place to another place.



Figure1.2. Vegetation on the earth

The third step, God has created some animals. There are many kinds of animals living in the earth. The characteristics of animals are that they proliferate, breathe, need food and water, It can move from one place to other place, but they do not have mind nor intelligence.



Figure1.3. Animals

And the last step, God has created human. They are the most perfect beings. The first person was Adam. Then, the God created a woman, named Eva (Siti Hawa). The characteristics of human beings are that they proliferate, breathe, need food and water, they can move from one place to other place. In addition, they have mind or intelligence.



Figure1.4. The first persons (Adam and Eva)

### Approximation

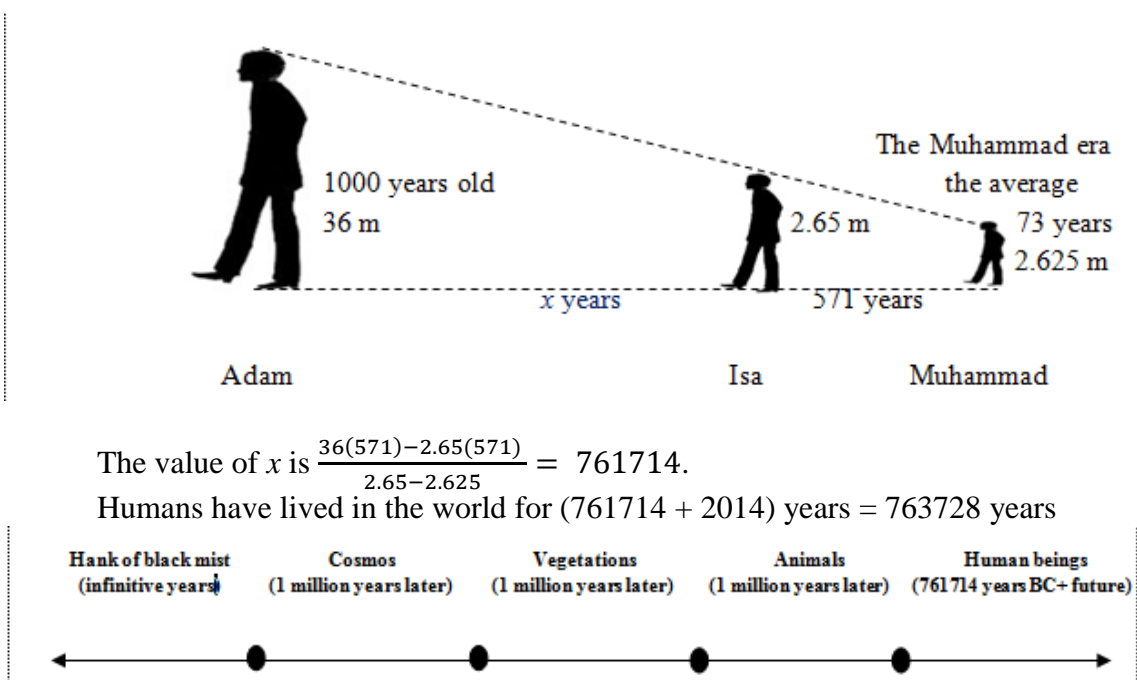


Figure1.5. the event line of the universe.

## 2. Discussion

The first concept of Mathematics known by human beings was single number, double number, equality and inequality. Equality and inequality are the simplest concept in Mathematics. To understand this concept we need not to count natural numbers, so that the material can be given to the pupils of nursery school (America), of play group/PAUD (Sekolah Pendidikan Anak Usia Dini) in Indonesia, and of a kindergarten.

Firstly, people knew single and double numbers.

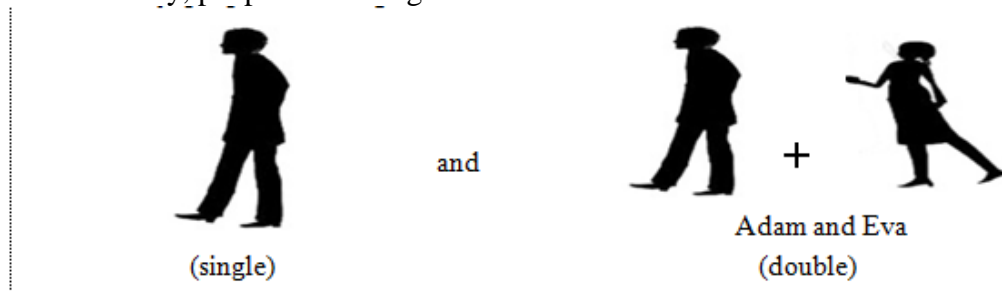


Figure2.1. Adam and Eva (Siti Hawa)

And it was developed into odd and even numbers.

### 2.1 Equality and Inequality

Next, people knew about equality and inequality after Eva gave birth to twins.

Figure2.1.1.The Adam's Family

The first conclusion is that the number of daughters is equal with the number of sons (equality).

Some years later Adam and Eva have last child

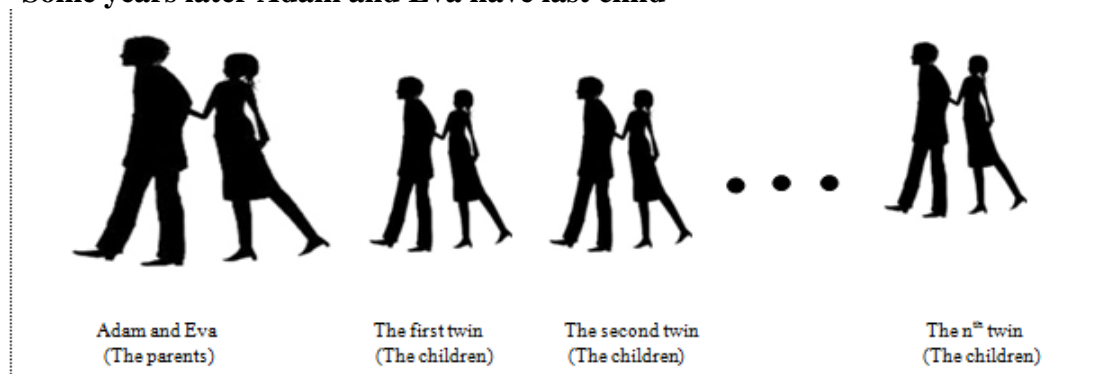


Figure2.1.2.The Adam's Family and the last child

The second conclusion is that the number of daughters is less than the number of sons (inequality).

Question: Which is more?



Figure2.1.3.The number of marbles is equal

Answer: equal

Question: Why?

Answer: one to one correspondence.



Figure2.1.4.The marbles can pair equally (one to one correspondence).  
Question: Which is more?



Figure2.1.5.The number of marbles is different

Answer: ???

Instruction: please match the blue marbles and the red ones!

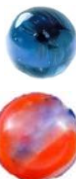
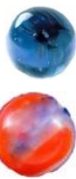


Figure2.1.6.The marbles are paired, but the red marbles are more than the blue ones.

The pupils conclude that the red marbles are more than the blue ones.

## 2.2 A Research on PAUD (Nursery School)

PAUD A-CINTA is located in Slumbung, Gandusari, Blitar, East Java, Indonesia. All pupils have already known single and double.



Figure2.2.1.All pupils of PAUD A-CINTA have already known single and double.



Nine out of ten pupils of PAUD A-CINTA know about equality and inequality, and about more than and less than.



Figure2.2.2.The pupils of PAUD A-CINTA know equality and inequality.

### 2.3. Mathematics has been Developed after Problems Appear in Our Life.

We know counting numbers after we know addition operation. When we work with subtraction, we get difficulty. For example: when we operate  $50 - 20 = 30$ , we will not have any problem because 30 is natural number. But, when we count  $40 - 90 = \dots?$ , then it will appear the negative number. When people know about division, the problems appear again. For example: when we operate  $10 : 2 = 5$ , we will not have any problem either, because 5 is integer. But when we count  $4 : 5 = \dots?$ , then it will appear the fraction numbers. When people know square equation, the problems appear again. For example: there will be no problem for  $x^2 - 25 = 0$ , because the solution is 5 and -5. They are integers. But, when we solve the square equation  $x^2 - 6 = 0$ , the value of  $x$  is  $\dots?$ , then, it will appear the irrational numbers, and so on. God has given problems or events to human based on their experiences, knowledge, and the environmental problems.

We know algebra, geometry, trigonometry, function, logarithm, after we get some problems in our life. Therefore, the perfect teaching in mathematics is that we use **experience knowledge and the environmental problems (EKEP) method** or **Pengalaman Pengetahuan dan Persoalan Lingkungan (PPPL/P3L)** on their life.

#### Conclusion:

1. The first people have known mathematics since the first human lived in the world.  
(The first we know single and double numbers, equality and inequality concept).
2. The simplest concept in mathematics is equality and inequality.
3. The best learning of mathematics we use experience, knowledge, and the environmental problems method.

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**Recommendation:**

1. Mathematics is introduced to pupils since young children.
2. When we teach mathematics, we can apply methods dealing with experience, knowledge, and the environmental problems method.

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